

AMENDMENTS TO THE CLAIMS

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. When strikethrough cannot easily be perceived, or when five or fewer characters are deleted, ~~[[double brackets]]~~ are used to show the deletion. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claims 1, 4, 7, 8, and 10-15 in accordance with the following:

1. (Currently Amended) A method to refine a lubricant comprising a compound having a perfluoropolyether structure, the method comprising:
~~utilizing supercritical extraction by contacting the lubricant with an extracting medium of supercritical carbon dioxide under a predetermined condition in a pressure vessel to remove ionic impurities from the lubricant~~
introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part;
contacting the raw material of the lubricant with a supercritical carbon dioxide under a predetermined condition in the pressure vessel to extract perfluoropolyether compounds for removing ionic impurities, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate; and
recovering the lubricant, from which ionic impurities are removed, through the outlet part.
2. (Original) The method to refine a lubricant according to claim 1, wherein the predetermined condition is a combination of a temperature and a pressure at which a density of the supercritical carbon dioxide is less than or equal to a density of the supercritical carbon dioxide at a temperature of 60°C and a pressure of 20 MPa.
3. (Original) The method to refine a lubricant according to claim 1, wherein the ionic impurities are included in the group consisting of sodium ions, potassium ions, chloride ions, HCO₃ ions, HSO₄ ions, and sulfate ions.
4. (Currently Amended) A method to refine a lubricant comprising a compound having a perfluoropolyether structure, the method comprising:
~~using supercritical extraction by contacting the lubricant with an extracting medium of~~

~~supercritical carbon dioxide under a predetermined condition in a pressure vessel to remove a perfluoropolyether compound having a terminal group of weak polarity from the lubricant~~

introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part;

contacting the raw material of the lubricant with a supercritical carbon dioxide under a predetermined condition in the pressure vessel to extract and remove a perfluoropolyether compound having a terminal group of weak polarity, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate; and recovering the lubricant, from which the perfluoropolyether compound having a terminal group of weak polarity is removed, from the pressure vessel.

5. (Original) The method to refine a lubricant according to claim 4, wherein the predetermined condition is a combination of a temperature and a pressure at which a density of the supercritical carbon dioxide is less than or equal to a density of the supercritical carbon dioxide at a temperature of 60°C and a pressure of 16 MPa.

6. (Original) The method to refine a lubricant according to claim 4, wherein the perfluoropolyether compound having a terminal group of weak polarity is a perfluoropolyether compound having a terminal group included in the group consisting of CF_3^- , CF_2H^- , and CF_2Cl^- .

7. (Currently Amended) A method to refine a lubricant comprising a compound having a perfluoropolyether structure, the method comprising:

~~utilizing supercritical extraction by~~

~~contacting the lubricant with an extracting medium of supercritical carbon dioxide under a first condition in a pressure vessel to remove a perfluoropolyether compound having a terminal group of weak polarity from the lubricant, and~~

~~contacting the lubricant from which a perfluoropolyether compound having a terminal group of weak polarity is removed with an extracting medium of supercritical carbon dioxide under a second condition to remove ionic impurities from the lubricant and to extract and recover the perfluoropolyether lubricant~~

introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part;

contacting the raw material of the lubricant with a supercritical carbon dioxide under a first condition in the pressure vessel to extract and remove a perfluoropolyether compound

having a terminal group of weak polarity, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate;

contacting the remaining lubricant, from which the perfluoropolyether compound having a terminal group of weak polarity is removed, with the supercritical carbon dioxide under a second condition in the pressure vessel to extract perfluoropolyether compounds for removing ionic impurities, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate; and

recovering the lubricant, from which both the perfluoropolyether compound having a terminal group of weak polarity and ionic impurities are removed, from the pressure vessel.

8. (Currently Amended) The method to refine a lubricant according to claim 7, wherein

the first condition is a combination of a temperature and a pressure at which a density of the supercritical carbon dioxide is less than or equal to a first density of the supercritical carbon dioxide at a temperature of 60°C and a pressure of 16 ~~Mpa~~MPa; and

the second condition is a combination of a temperature and a pressure at which a density of the supercritical carbon dioxide is less than or equal to a second density at a temperature of 60°C and a pressure of 20 MPa.

9. (Original) The method to refine a lubricant according to claim 7, wherein the perfluoropolyether compound having a terminal group of weak polarity has a terminal group included in the group consisting of CF_3^- , CF_2H^- , and CF_2Cl^- , and the ionic impurities are included in the group consisting of sodium ions, potassium ions, chloride ions, HCO_3^- ions, HSO_4^- ions, and sulfate ions.

10. (Currently Amended) A perfluoropolyether lubricant refined by utilizing supercritical extraction ~~by, wherein the lubricant contacts an extracting medium of supercritical carbon dioxide under a predetermined condition in a pressure vessel to remove ionic impurities from the lubricant~~

introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part,

contacting the raw material of the lubricant with a supercritical carbon dioxide under a predetermined condition in the pressure vessel to extract perfluoropolyether compounds for removing ionic impurities, wherein the supercritical carbon dioxide is introduced from the inlet

part and flows through the pressure vessel at a predetermined rate, and
recovering the lubricant, from which ionic impurities are removed, through the outlet part.

11. (Currently Amended) A perfluoropolyether lubricant refined by using supercritical extraction ~~by, wherein the lubricant contacts an extracting medium of supercritical carbon dioxide under a predetermined condition in a pressure vessel to remove a perfluoropolyether compound having a terminal group of weak polarity from the lubricant~~

introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part,

contacting the raw material of the lubricant with a supercritical carbon dioxide under a predetermined condition in the pressure vessel to extract and remove a perfluoropolyether compound having a terminal group of weak polarity, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate, and
recovering the lubricant, from which the perfluoropolyether compound having a terminal group of weak polarity is removed, from the pressure vessel.

12. (Currently Amended) A perfluoropolyether lubricant refined by utilizing supercritical extraction by

~~contacting the lubricant with an extracting medium of supercritical carbon dioxide under a first condition in a pressure vessel to remove a perfluoropolyether compound having a terminal group of weak polarity from the lubricant, and~~

~~contacting the lubricant from which a perfluoropolyether compound having a terminal group of weak polarity is removed with an extracting medium of supercritical carbon dioxide under a second condition to remove ionic impurities from the lubricant and to extract and recover the perfluoropolyether lubricant~~

introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part,

contacting the raw material of the lubricant with a supercritical carbon dioxide under a first condition in the pressure vessel to extract and remove a perfluoropolyether compound having a terminal group of weak polarity, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate,

contacting the remaining lubricant, from which the perfluoropolyether compound having a terminal group of weak polarity is removed, with the supercritical carbon dioxide under a second condition in the pressure vessel to extract perfluoropolyether compounds for removing ionic

impurities, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate, and

recovering the lubricant, from which both the perfluoropolyether compound having a terminal group of weak polarity and ionic impurities are removed, from the pressure vessel.

13. (Currently Amended) A magnetic recording medium₁ comprising:

a nonmagnetic substrate[[]];

a plurality of layers sequentially laminated on the substrate, the layers including at least

a nonmagnetic underlayer[[]];

a magnetic layer, and

a protective layer; and

a lubricant layer, applied to the protective layer, wherein the lubricant layer substantially comprises a perfluoropolyether lubricant refined by utilizing supercritical ~~extraction~~by extraction ~~by contacting the lubricant with an extracting medium of supercritical carbon dioxide under a predetermined condition in a pressure vessel to remove ionic impurities from the lubricant~~
introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part,

contacting the raw material of the lubricant with a supercritical carbon dioxide under a predetermined condition in the pressure vessel to extract perfluoropolyether compounds for removing ionic impurities, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate, and

recovering the lubricant, from which ionic impurities are removed, through the outlet part.

14. (Currently Amended) A magnetic recording medium₁ comprising:

a nonmagnetic substrate;

a plurality of layers sequentially laminated on the substrate, the layers including at least

a nonmagnetic underlayer,

a magnetic layer, and

a protective layer; and

a lubricant layer, applied to the protective layer, wherein the lubricant layer substantially comprises a perfluoropolyether lubricant refined by utilizing supercritical ~~extraction~~by extraction ~~by contacting the lubricant with an extracting medium of supercritical carbon dioxide under a first condition in a pressure vessel to remove a perfluoropolyether compound having a terminal group~~

~~of weak polarity from the lubricant, and contacting a lubricant from which a perfluoropolyether compound having a terminal group of weak polarity is removed with an extracting medium of supercritical carbon dioxide under a second condition to remove ionic impurities from the lubricant and to extract and recover the perfluoropolyether lubricant~~

introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part,

contacting the raw material of the lubricant with a supercritical carbon dioxide under a first condition in the pressure vessel to extract and remove a perfluoropolyether compound having a terminal group of weak polarity, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate,

contacting the remaining lubricant, from which the perfluoropolyether compound having a terminal group of weak polarity is removed, with the supercritical carbon dioxide under a second condition in the pressure vessel to extract perfluoropolyether compounds for removing ionic impurities, wherein the supercritical carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate, and

recovering the lubricant, from which both the perfluoropolyether compound having a terminal group of weak polarity and ionic impurities are removed, from the pressure vessel.

15. (Currently Amended) A magnetic recording medium, comprising:

a nonmagnetic substrate;

a plurality of layers sequentially laminated on the substrate, the layers including at least

a nonmagnetic underlayer,

a magnetic layer[[:]], and

a protective layer; and

a lubricant layer, applied to the protective layer, wherein the lubricant layer substantially comprises a perfluoropolyether lubricant refined by ~~using supercritical extraction by contacting the lubricant with an extracting medium of supercritical carbon dioxide under a predetermined condition in a pressure vessel to remove a perfluoropolyether compound having a terminal group of weak polarity from the lubricant~~

introducing a raw material of the lubricant into a pressure vessel having an inlet part and an outlet part,

contacting the raw material of the lubricant with a supercritical carbon dioxide under a predetermined condition in the pressure vessel to extract and remove a perfluoropolyether compound having a terminal group of weak polarity, wherein the supercritical

carbon dioxide is introduced from the inlet part and flows through the pressure vessel at a predetermined rate, and

recovering the lubricant, from which the perfluoropolyether compound having a terminal group of weak polarity is removed, from the pressure vessel.